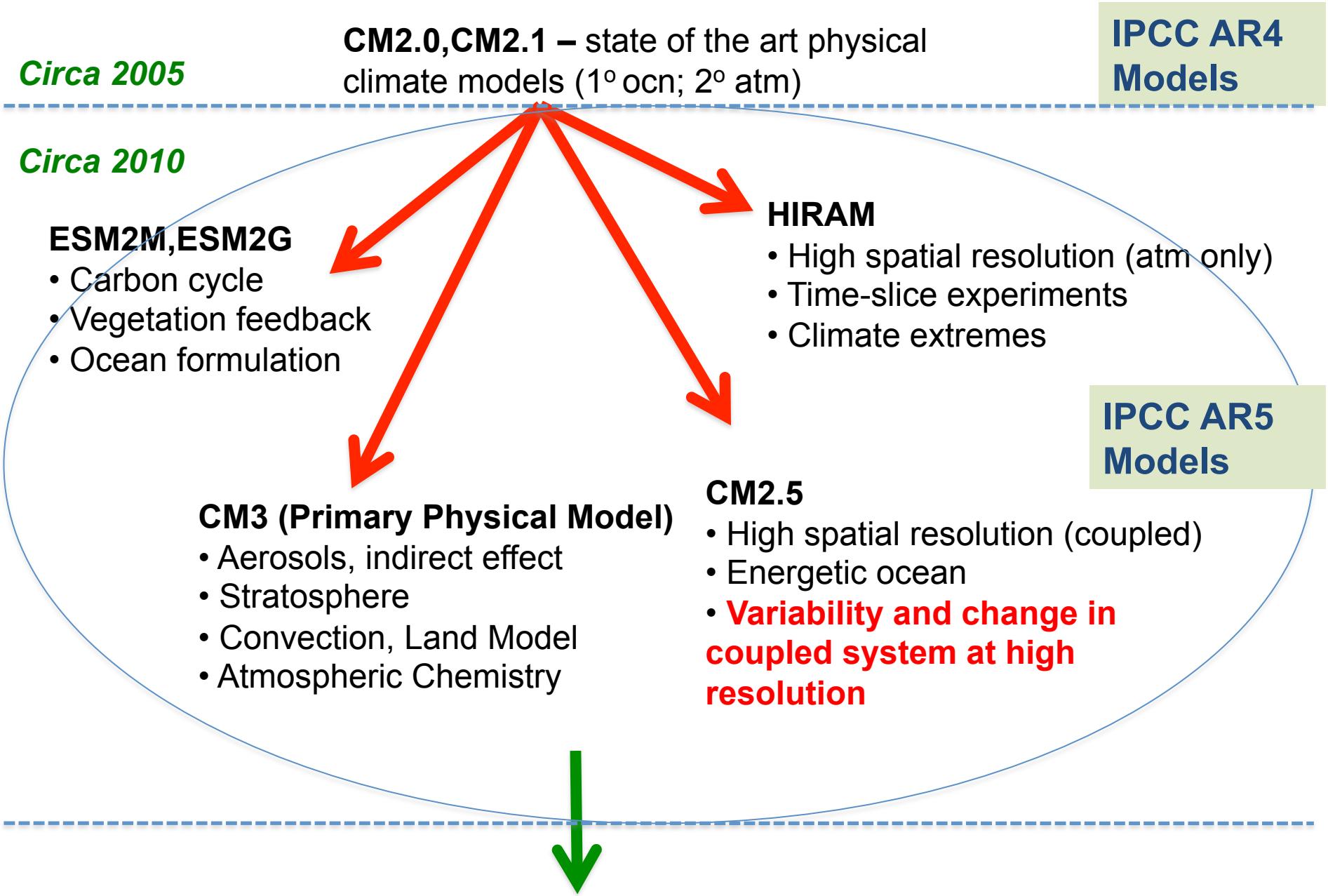
Circa 2005
CM2.0,CM2.1 – state of the art physical climate models (1º ocn; 2º atm)
IPCC AR4 Models
Circa 2010
ESM2M,ESM2G
• Carbon cycle
• Vegetation feedback
• Ocean formulation
HIRAM
• High spatial resolution (atm only)
• Time-slice experiments
• Climate extremes
IPCC AR5 Models
CM3 (Primary Physical Model)
• Aerosols, indirect effect
• Stratosphere
• Convection, Land Model
• Atmospheric Chemistry
CM2.5
• High spatial resolution (coupled)
• Energetic ocean
• Variability and change in coupled system at high resolution
"CM4" ?? - drawing on what is learned from these various streams, and advancing

A Vision for MOM Evolution

GFDL is engaged in a multi-year project to unify capabilities from MOM5 with GFDL's generalized layered ocean model, GOLD.

- MOM6 is motivated by ocean/climate science challenges:
  - Wide range of time scales – seasonal to decadal to centennial
  - Wide range of space scales – e.g., mesoscale eddy resolving for global climate
  - Increasingly comprehensive – e.g., coupling to biogeochemistry, ecosystem, icebergs and ice shelf models
- MOM6 will employ state-of-the-science numerical methods and physical parameterizations that are key to, for example,
  - respecting the integrity of ocean water-masses
  - capturing transient climate fluctuations
  - predicting climate variations
  - projecting future climate change
- MOM6 will incorporate GOLD's functionality for generalized vertical layers, and will retain a direct link to scientifically important MOM configurations.

GFDL's MOM Commitment

- **Continue development of the MOM series, taking advantage of the scientific advances, expertise and experience.**
- **Making the state-of-the-art GFDL ocean models available to NCEP upon successful development and testing.**
- **Training in the use of the MOM series.**
- **Contribute to a unified NOAA Ocean-related modeling strategy, leading to useful NOAA products for scientific applications and predictions from the intraseasonal to interannual to decadal to centennial timescales.**
- **Collaborative research involving analysis of simulations with the newer models, and addressing NOAA's central challenges.**
- **Regular meetings with NCEP for monitoring progress in modeling.**

The END

Current NOAA/ GFDL Climate Modeling
including for CMIP5 and IPCC AR5 [Report in 2013]

Advancing the understanding of the climate and Earth System - the processes, mechanisms, and interactions

➔ ***reliable global- to regional-scale projections and predictions:***

1. **Role of pollutant particulates and other short-lived species compared to long-lived gases such as carbon dioxide.**
2. **Carbon and other biogeochemical cycles, uptake of carbon by land and oceans, and their roles in climate change.**
3. **High-resolution, atmosphere-ocean models for seasonal- to-centennial variability, predictability and regional change.**
4. **High-resolution models for understanding "weather extremes" in climate (e.g. hurricanes, heat waves and droughts).**